

SAN **EPIDSA PROJECT 2003-2006**

Using visuals to communicate with low literate audiences on health issues

Fons Maes
Adelia Carstens
Lilian Gangla-Birir
Hanneke Hoogwegt
Karen Foesenek

Piet Swanepoel, Leon de Stadler, Iris Nieuwboer, Anneke Langenhuijsen

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SAN **EPIDSA PROJECT 2003-2006**

Survey of the talk

- Visual literacy
 - What makes visual literacy for low literate audiences complicated?
 - What makes the study of visual literacy for low literate audiences complicated?
- Subproject 4 - What projects did we carry out?
 - Carstens, Maes, Birir 2006 - Foesenek, 2006
 - Hoogwegt, Forthc.
- What is coming up?
 - State of the art and prospects project Lilian
 - Discuss about suitable next steps

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Un bon croquis vaut mieux qu'un long discours (N.B.)

- A picture is worth a thousand words (C.)
- One would expect this proverb to be more true in a low literate (LL) environment in which written language is useless.
- The absence of reading in LL
 - does not make the use of visuals automatically more easy, on the contrary
 - makes visuals relatively more crucial as message carrier, however limited they are.



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The visual medium for LL audiences ambitious functional goals - serious functional limitations

- Communicate cognitively complex messages successfully
- Communicate sensitive health messages successfully
- Communicate persuasive messages successfully
 - Perceiving – comprehending – persuading – changing behaviour
- Make visuals as self supporting as possible
 - Without electricity
 - Without language
 - Without human help
- Visual code is limited
- Visuals often forced choice
- Low level of visual literacy
 - Low level of exposure to visuals
 - Low variation in visual genres
 - Low opportunity of visual learning by verbal anchoring
 - Low experience in non literal visual representations
 - Low experience with visual abstractions and conventions
- Visuals are by definition abstractions, LL miss the skill to read abstract representations.

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Basic problem: Visual Literacy ~ Verbal literacy

- As (formal) learning/literacy in all societies means learning to write and read language, the concept of visual literacy is very much amalgamated with that of verbal literacy
- Verbally literates learn/have skills that are very much useful for 'reading' visuals
 - Reading as combining atomic elements to a structured whole
 - Looking at language or a sequence of visuals in an orderly way (L-R, T-B) (e.g., Doak and Doak)
 - Phoneme-grapheme mapping
 - Understanding that a visual sign represents a convention
 - Verbal literacy helps humans abstracting away from reality
 - Categorizing concepts (e.g., Luria)
 - From situational to generic thinking

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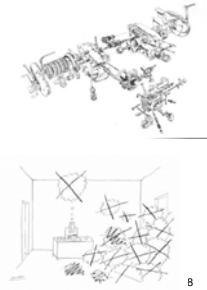
Visual atoms and visual syntax (Eisner, 1985)



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Deliberate violations



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Un bon croquis vaut mieux qu'un long discours, applied to visuals for LL?

- Unfavorable conditions
 - The limitation in communicative power
 - The complexity of visuals
 - The low literate context
- Favorable conditions
 - Robust medium in LL context
 - Easy medium (produce, use, distribute, keep available, etc.)



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Studying visuals for LL audiences ambitious goals & serious limitations

- Studying the effect of cognitively complex, sensitive (health related), persuasive messages on LL users
- Finding an adequate 'theoretical language' to talk about form/structure, meaning and effect of visuals
- Develop predictive theories about the relationship between aspects of visuals and the human (literate and LL) mind.
- Finding methods to bridge the gap between literate researchers and LL participants
- Contribute to the design of adequate visuals by heuristics, research methods etc.
- Lack of common theoretical language on visuals
- LL are unpopular study object for researchers
 - Birds, whales, elephants, children > LL
 - Many practical studies, case studies
 - No fundamental research into LL cognition & communication
- Poor image/past performance of research on low literacy
- The lack of reliable research methods
- LL difficult target group for researchers

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Lack of common theoretical language on visuals

- A theoretical language on visuals is necessary
 - to talk about visuals, to name, detect and expect problems and effects
- There is no common language, but many perspectives and attempts to
 - The perceptual perspective of gestalt
 - How can visuals reflect cognitive principles of perception (closure, good continuation, etc.)?
 - The technical and aesthetic perspective of graphic art
 - How can manipulations of visuals be described (e.g. in Photoshop)?
 - The learning perspective of educational psychology or instructional sciences
 - what makes visuals successful in learning (e.g. dual coding, cognitive load, etc.)?
 - The rhetorical perspective of marketing and rhetorics
 - What makes visuals persuasive (e.g. schemes vs. tropes)?
 - The cognitive perspective of spatial cognition
 - which cognitive residues can be found in visuals (large is important, up is more etc.)
 - How do bottom-up processes of perception relate to top-down processes of cognition?
 - The computational perspective of language technology – multimodal information presentation
 - How to allocate the right modality to the right piece of information
 - Etc.

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Un bon croquis vaut mieux qu'un long discours, applied to the study of visuals for LL?

- Unfavorable conditions
 - The low research image
 - The complex research object
 - The complex research environment
 - The lack of theories and methods
- Favorable conditions
 - The relevance of the research topic and application area
 - The opportunity to connect to 'literate' research traditions



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 - Carstens, Maes, Birir 2006 - Foeseenek, 2006
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Using verbal and visual presentation formats in HIV/AIDS instructional documents (subproject 4)

- Different studies with more or less the same research perspective
 - Perception and comprehension
 - How do visuals communicate complicated (and delicate) instructional health messages for low literate or illiterate audiences in SA.
 - Methodology
 - Present individual (or series of) visuals to (literate/low literate) ppn
 - Analyse verbal and visual output of ppn
 - Perspective on visuals
 - Consider visuals 'as if' they are useful information carriers for low literate audiences.
- Gradual improvement of methodology, collection method, relation to theoretical research questions.

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Langenhuijsen 2003 (De Stadler – Maes)

- Comprehension of and attitude towards different pictorial variants of series (level of reality/analogy and level of detail/redundancy)
- Material
 - 3 series of instructional visuals, differing in the degree of analogy
- Method
 - Interview
 - Between subjects
- Many methodological and technical problems, clearly due to unfamiliarity with target audience, research context, topic etc.

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Langenhuijsen, 2003 – three series of visuals visual 'morphology'



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Nieuwboer 2005 (Swanepoel – Maes)

- The persuasive power of peer guides in websites that promote HIV/AIDS voluntary counselling and testing
- Material
 - Construction of 3 VCT websites with different degrees of visualization
 - Objective
 - With verbal guide
 - With verbal guide + visual guide
- Method
 - Between subjects
 - Appreciation Questions
 - » Nieuwboer, I., Maes, A., & Swanepoel, P. (2006). The persuasive power of peer guides in websites that promote HIV/AIDS voluntary counselling and testing. International Professional Communication Conference (IPCC), p. 829-839, Limerick, Ireland.

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Nieuwboer, 2006 – visualization of peer guides on VCT-websites



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Birir (Forthc.)

- How do literates and illiterates comprehend visuals in illustrated brochures?
- Materials
 - Series of visuals embedded in a brochure
 - One original version, one blurred version
- Method
 - Structured interview
 - Low literates exposed to original version
 - Literates exposed to blurred version

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Birir (forthc.)



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Low literate condition

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Literate condition

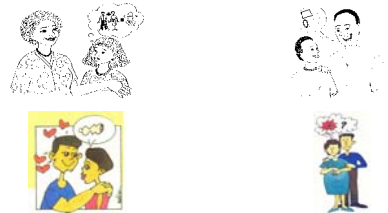
Carstens, Maes, Birir 2006 – Foesenek 2006

- How do literates and low/illiterates differ in the way in which they comprehend complex communicative visuals
- Materials
 - Selection of complex single visuals taken from different SA campaigns
- Method
 - Structured interviews
 - Visuals: One material condition
 - Two groups Different conditions based on different levels of literacy of pp
- Gradual improvement of method
 - Selection of participants, elicitation method (English --> native language), recording, systematic questions about different levels of complexity

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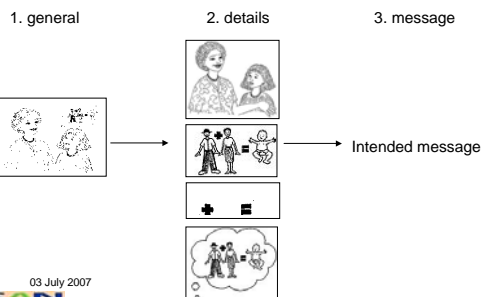
Carstens, Maes, Birir, 2006 – Foesenek 2006.



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Interview scheme ~ levels of understanding



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Different levels of understanding and abstraction

- Recognizing message form
 - relevant atomic elements
 - Human
 - Object
 - Abstract elements
 - Recognizing structural composition
 - Spatial closeness of central elements (= meaning closeness)
 - Relative size of elements
 - More analogical (e.g., mother and child)
 - More abstract (e.g., figure/center – ground/periphery)
 - relational visual elements (cloud with arrow or blobs)

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Different levels of understanding and abstraction 2

- Recognizing message meaning (proposition – state of affairs – what is happening)
 - Roles of humans (large-small --> parent-child)
 - Activity expressed
 - People talking
 - Open mouth (speaking) – looking at (listening) – friendly conversation
 - Daughter thinking
 - Cloud + blobs
- Recognizing message intention
 - Modality (what is happening --> what does the message tell me?)
 - Genre of visual: advice on how to live healthy

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Carstens, Maes, Birir, 2006 – number of recognized humans, objects, abstract objects by L and LL

	Literates N=24 (12.6 y/ schooling)	Low-literates N=30 (3.7 y/schooling)
Number of humans recognized (n=10) (10 duos, trios or individuals in 9 visuals)	8,83	9,07
Number of analogous objects recognized (n=10)	9,13	7,77
Number of abstract objects recognized (n=11)	8,71	4,57

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Carstens, Maes, Birir, 2006 – % recognized abstract objects by literates and low literates

	Literates	Low-literates
Modality signal - Prohibition cross		
• Do not drink alcohol (v12)	91,7	90
• Do not smoke (v13)	95,8	90
• Do not eat this food (v10)	75	43,3
• Do not sleep with your partner (v3)	87,5	30
Metaphors		
• clock stands for taking pills on time (v14)	91,7 (83,3)	73,3 (45,3)
• Hearts stands for love (v4)	54,2	30
• monster stands for danger of AIDS (v5)	66,7	36,7
Suggestion of action		
• action lines (v8)	50	16,7
Symbols		
• Vack (v11)	66,7	43,3
• Mathematical symbols (+, -) (v1)	66,7	3,3
Speech and thought suggestions		
• Speech balloon (v3)	62,5	3,3
• Thought balloon (v2)	58,3	3,3

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Foesenek, 2006

Mean percentage of elements recognized correctly as a function of literacy and context

	Low literates without context (n=20)	Low literates with context (n=14)	Literates (n=13)
Concrete representation	79,0	81,5	91,1
humans (n=13)	97,7	97,3	93,6
meaningful bodily elements (n=13)	50,4	53,8	82,2
analogical objects (n=11)	90,5	94,2	98,4
Abstract representation	56,3	64,7	89,1
conventional symbols (n=15)	57,7	62,9	90,3
metaphor (n=1)	20,0	7,1	53,8
metonymy (n=6)	62,5	75,7	87,2

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What did we learn?

- The effect of context
 - Genre and topic context is very important in interpreting visuals
- The effect of familiarity
 - Familiarity with objects and situations is crucial
 - The human body is a rich source of cognitively natural, embodied interpretation
- The effect of abstraction
 - Interaction between abstraction degrees and literacy levels
- The language of visuals?
 - Abstraction comes in different degrees and formats

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Different degrees of analogy/abstraction 1

- 'Morphological' abstraction
 - Pictorial elements representing humans or objects have different degrees of analogy (see Langenhuijsen, 2003)




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Different degrees of analogy/abstraction 2

- Relational abstraction on the level of syntax, semantics or pragmatics
 - Pictorial elements connecting different pictorial elements representing relations between pictorial elements which can be interpreted in terms of syntax, semantics, pragmatics

syntactic  Large=main clause; small= subclause

semantic  Content = belief status


pragmatic  Content = do not do this

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Different degrees of analogy/abstraction 3

- Semantic abstraction
 - Pictorial elements represent entities with a different degree of concreteness/literalness etc.

metonymy  White bread and soda = unhealthy food

metaphor  Monster = aids

symbol  Heart = love

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A more controlled investigation of the problem of visual abstraction

- Starting point
 - Basic case of visual abstraction
 - Expressing ACTION in STATIC visuals
 - Research question
 - The effect of using different techniques to express action in static visuals
 - Affordances of objects
 - Affordances of body actions
 - Using abstract elements
 - » Arrow as prototypical abstract element with a highly analogical residue (Heiser & Tversky, 2006 and many others)
 - combinations

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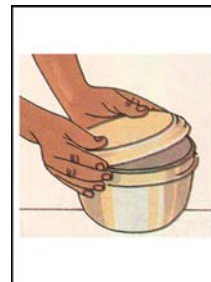
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Hoogwegt (forthc.)

- How do low literates comprehend different ways of expressing action in visuals
- Materials
 - Construction/manipulation of single simple instructional visuals with or without embodied and abstract action indication (objects – hands – arrows)
- Method
 - Structured interviews
 - Between subjects

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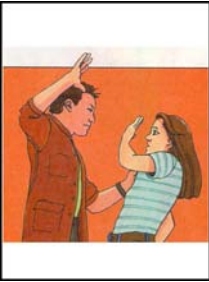
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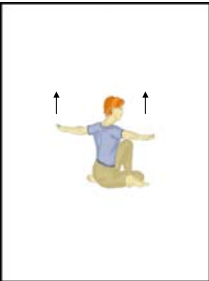
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Part 1: Visuals with and without arrows (n=11)

- Interview scheme
 - What do you think is happening? (spontaneous)
 - Do you see any movement? (elicited)
 - What makes you think that? (elicited)
- Material
 - 11 visuals in 2 versions
- 2 conditions
 - Without arrows (n=23)
 - With arrows (n=23)
- Comprehension variables
 - Dynamic vs static comprehension
 - Correct comprehension


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Effect of arrows on dynamic interpretation

Mean number of visuals (n=11) with a dynamic interpretation dependent on condition (+ arrow, - arrow)

	- arrow n = 11	+ arrow n = 11
Dynamically interpreted visuals	9.48	9.61
•Spontaneous	7.13	8.04
•Elicited	2.35	1.57

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Effect of arrows on the interpretation of correct action

Mean number of visuals per participant which is interpreted correctly

	- arrow n = 11	+ arrow n = 11
Correct motion mentioned	6.57	7.04
•Spontaneous	5.13	5.57
•Elicited	1.43	1.48

Part 2: hands, hands +arrow, arrow (n=5)



- Interview scheme
 - What do you think is happening? (spontaneous)
 - Do you see any movement? (elicited)
 - What makes you think that? (elicited)
- Material
 - 5 visuals in 3 versions
- 3 conditions
 - hands (n=23)
 - Hands + arrows (n=23)
 - Arrows (n=24)
- Comprehension variables
 - Dynamic vs static comprehension
 - Correct comprehension

Effect of hands and arrows on dynamic interpretation

Mean number of visuals per condition with a dynamic interpretation

	+ arrow n = 5	+hands n = 5	+ arrow + hands n = 5
Dynamically interpreted visuals	3.50	@	4.83
•Spontaneous	2.17		3.96
•Elicited	1.33		0.87

Effect of hands and arrows on the interpretation of correct action

Mean number of visuals per condition with a correct interpretation

	+ arrow n = 5	+ hands n = 5	+ arrow + hands n = 5
Correct motion mentioned	2.04	@	4.09
•Spontaneous	1.38		3.04
•Elicited	0.67		1.04

The only visual with differences

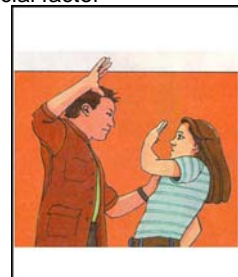
	Dynam.	Correct
hands	87.0%	39.1%
hands + arrows	95.7%	69.6%
arrow	66.7%	25.5%




"I see a condom with the arrow pointing down it shows that the condom is put around a man's penis"
 "This one is like it is a hand... somebody is holding a bottle... and I don't know what this is... and another thing, it is like a leg... like a leg... a lady opening its leg and opening a vagina.."

Familiarity as crucial factor

	Dynam.	Correct
no arrow	100%	95.7%
arrow	100%	87.0%




	Dynam.	Correct
No arrow	100%	82.6%
arrow	100%	91.3%



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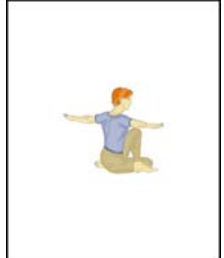
Familiarity as crucial factor

	Dynam.	Correct
No arrow	30.4%	0.0%
arrow	47.8%	4.3%



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	Dynam.	Correct
No arrow	91.3%	13.0%
arrow	82.6%	13.0%



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Visual 7


	Dynam.	Correct
No arrow	60.9%	4.3%
arrow	56.5%	13.0%



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A last indication of the non-effect of arrows

- What is the intended message?
 - No difference between static (descriptive, THAT) and dynamic (procedural, HOW) message phrases
 - What I can learn is THAT we must not beat up women*
 - We must learn HOW to protect ourselves against women abuse*
- Wrong!
 - The woman must always listen to the man*
 - I can learn that the duty of the man is to beat the woman*



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Conclusion

- Arrows do not (or hardly) make comprehension more dynamic
- Arrows do not (or hardly) make comprehension more correct
- Bodily elements and objects act as embodiment theory would predict
 - Hands are much more powerful indicators than arrows
 - Familiar objects and actions are more easily interpreted dynamically than unfamiliar objects and actions

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The effectiveness of various presentation formats in instructional documents for low-literate HIV-positive patients and their caregivers

Lilian Gangla Birir
University of the Free State

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Purpose and research question

- To examine how people with different levels of literacy interpret visuals with abstractions used in HIV/AIDS educational documents and how people produce visuals with abstractions to express HIV/AIDS related messages
- Main question**
- How do literates and illiterates comprehend visuals in illustrated brochures?
- Sub questions**
- How do levels of abstraction in HIV/AIDS visuals relate to levels of literacy in South Africa?

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General framework

- Theoretical foundations: low literacy, visual literacy, health and literacy, visual literacy in the health context and comprehension of concrete and abstract elements.

The project consists of three components:

- Study 1: The quality of HIV/AIDS visuals in South Africa- a case study
- Study 2: How do low literate audiences understand HIV/AIDS related visuals
- Study 3: Production of visuals

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Study 1: The quality of HIV/AIDS visuals in South Africa- a case study

- **Material:** Sections of Soul City (2004) *HIV and AIDS and Treatment* (Take care of your mind and body; eat healthy food; starting anti retroviral treatment; how to make ART work for you)
- **Analysis 1:** What is the quality of the visuals as compared to the guidelines that can be found in the literature? (Text and Visuals)

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Study 1: The quality of HIV/AIDS visuals in South Africa- a case study

Analytical framework

Text: content, simple language, type style and size, upper case and lower case letters

Design/layout – one message per illustration, limit number of concepts, white spaces, logical sequence,

Illustrations- colour,, familiar images, realistic, simple, context based illustrations, appropriate symbols, appropriate illustrative style, use of a positive approach

Analysis 2: What makes these visuals difficult from the perspective of low literate audiences? (Focus on abstraction)

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Study 1: The quality of HIV/AIDS visuals in South Africa- a case study

Analytical scheme:

Category 1: what can be seen [persons(roles, bodily elements, positioning of person with each other); objects(functions, actions, events, situations depicted); →

Category 2: what is the intended message (ultimate advise)

Category 3: how to deduce the intended message from what is visible (e.g. bodily element –mouth opentalking) conventional symbols, abstract elements

Category 4: expectations and hypotheses about difficulty of types of visual elements and types of interpretations.

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Study 2: How do low literate audiences understand HIV/AIDS related visuals

- Research design: experimental
- Material: visuals selected from Soul City (2004) *HIV and AIDS and Treatment* (Take care of your mind and body; eat healthy food; starting anti retroviral treatment; how to make ART work for you)
- Sampling: purposive and convenient
- Instrumentation: individual interview (low literate) questionnaire (literate)
- Procedure
- Data analysis: (coding)

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Study 3: Production of visuals

- Design: experimental
- Instrumentation: ask participants to depict a number of important life skills; individual interviews to discuss their drawings in order to find out what they intended to depict
- Data analysis (pictorial data & data from post interviews)

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